

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl.No.: 10/081,355 Confirmation No.: 9762
Appellant: Anandakumar et al
Filed: February 21, 2002
TC/AU: 2654
Examiner: Pierre

Docket: TI-29773
Cust.No.: 23494

APPEAL BRIEF (reinstated appeal)

Commissioner for Patents
P.O.Box 1450
Alexandria VA 22313-1450

Sir:

The attached sheets contain the Rule 41.37 items of appellant's Appeal Brief; this brief is pursuant to MPEP 1204.01 (Reinstatement of Appeal) and the Notice of Appeal filed in response to the decision of the Examiner mailed 12/29/2006. The fee for filing a brief in support of the appeal has previously been paid; but the Director is hereby authorized to charge any other necessary fees to the deposit account of Texas Instruments Incorporated, account No. 20-0668.

Respectfully submitted,

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Rule 41.37(c)(1)(i) Real party of interest

Texas Instruments Incorporated owns the application.

Rule 41.37(c)(1)(ii) Related appeals and interferences

There are no related dispositive appeals or interferences.

Rule 41.37(c)(1)(iii) Status of claims

Pursuant to MPEP 1205.02, for each claim in the case appellant states the status as follows:

Claim 1: rejected

Claim 2: rejected

Claim 3: rejected

Claim 4: rejected

Claim 5: rejected

Claim 6: rejected

Claim 7: rejected

Claim 8: rejected

Pursuant to MPEP 1205.02, appellant identifies each claim on appeal as follows

Claim 1: on appeal

Claim 2: on appeal

Claim 3: on appeal

Claim 4: on appeal

Claim 5: on appeal

Claim 6: on appeal

Claim 7: on appeal

Claim 8: on appeal

Rule 41.37(c)(1)(iv) Status of amendments

There is no amendment after final rejection.

Rule 41.37(c)(1)(v) Summary of claimed subject matter

The independent claims on appeal consist of method claim 1, method claim 4, and apparatus claim 7.

The subject matter of claim 1 is a method for playout of packetized digital speech by deferring truncation of an active frame (application page 11, lines 27-28) and truncating a silence frame (application page 11, lines 26-27).

The subject matter of claim 4 is a method of digital speech frame playout expansion by classifying a frame as voiced or not (application page 12, lines 26-27) and expanding a voiced frame by a multiple of the pitch of the voiced frame (application page 13, lines 6-8).

The subject matter of claim 7 is a receiver for encoded digital speech with an input for receiving CELP-encoded frames (application page 14, line 27 to page 15, line 1) a decoder coupled to said input (application page 14, lines 27-28) and a playout scheduler coupled to said input (application page 14, lines 27-28) where the decoder provides expansion of a voiced frame in response to the playout scheduler (application page 12, lines 26-27) and the expansion is a multiple of the pitch for the voiced frame (application page 13, lines 6-8).

As background, the claimed subject matter relates to playout (scheduling and decoding) of packetized frames of digital speech when packets arrive late: claim 1 relates to playout methods which truncate frames (used to reduce a too-large playout delay), claim 4 relates to playout methods which expand frames (used to fill in when playout delay has jump increase), and claims 7-8 relate to receivers capable of playout including (decoded) frame truncation and expansion as in claims 1 and 4. In general, frames of digital speech may be encoded (to reduce the number of bits required) and transmitted over networks in the form of packets analogous to data transmission (e.g., VoIP over the Internet), but transmission delays may cause packets to arrive late. In this case, playout methods attempt to manage the time gap caused by the late frames; Fig.1 illustrates varying arrival times and the expansion of frame m by repeated portions $T^{(m)}$ until frame m+1 is available. After the late arrivals, the playout

methods attempt to reduce the increased playout delay back towards a target playout delay by shortening the length of some frames.

More particularly, for claim 1, application page 11, last paragraph and page 12, middle paragraph describe the shortening of frames by truncation of silence frames (e.g., a 20 millisecond frame shortened to 4 milliseconds by cutting off the last 16 milliseconds), but not truncating active speech frames.

For claim 4, application page 12, last paragraph to page 13, paragraph (1) describe the expansion of voiced frames by integer multiples of the pitch as illustrated in Fig.1 where frame m is expanded with three repeats of a pitch length portion labeled $T^{(m)}$.

For claim 7, Fig.5 illustrates the functional blocks of a receiver which provides playout frame expansion as in claim 4.

Rule 41.37(c)(1)(vi) Grounds of rejection to be reviewed on appeal

The grounds of rejection to be reviewed on appeal are:

1. Claims 1-8 were rejected under 35 USC § 102(e) as anticipated by Gao et al. (USP 6,173,257).

Rule 41.37(c)(1)(vii) Arguments

1. Claims 1-8 were rejected as anticipated by Gao.

Claims 1-3: The Examiner cited Gao column 4, lines 52-54 as showing the deferring truncation of an active frame required by clause (a) of claim 1 and cited Gao column 4, lines 52-54 plus column 18, lines 4-7 as showing the truncation of a silence frame required by clause (b) of claim 1. However, the cited Gao column 4, lines 52-54 do not relate to frame truncation, but rather, lines 53-65 note that lower bit-rate encoding can be achieved by modeling the speech. Likewise, cited Gao column 18, lines 4-7 do not relate to frame truncation, but rather, describe a parameter for smoothing the LSFs. In fact, Gao primarily discloses speech encoding and does not relate to the playout of packetized speech; so Gao fails to anticipate or even suggest base claim 1 or its dependent claim 2-3.

Claim 4-6: The Examiner cited Gao Fig.2 elements 279 and 263 for the expanding a frame requirement of clause (b) of claim 4. However, Fig. 2 elements 279 and 263 do not relate to frame expansion; indeed, element 279 includes analysis of a frame (speech classification, unvoiced detection, periodicity and sharpness measurement, and noise level measurement) for encoding and element 263 is the fixed codebook gain. Again, Gao primarily is an encodec and does not suggest frame expansion for playout as in claims 4-6. Consequently Gao does not suggest base claim 4 or its dependent claims 5-6.

Claims 7-8: The Examiner cited Gao Table 1 in column 9 for a playout scheduler required by clause (c) of claim 7 and column 36, line 65 to column 37, line 10 for the frame expansion by the decoder required by clause (d) of claim 7. However, Gao Table 1 in column 9 recited the bit allocation for encoding at various bit-rates; this is not related to playout scheduling. Likewise, column 36, line 65 to column 37, line 10 is fixed codebook decoding and is not related to frame expansion. As previously noted, Gao primarily is an encoder and has no suggestion of the playout receiver of base claim 7 and its dependent claim 8.

Rule 41.37(c)(1)(viii) Claims appendix

1. A method for playout of packetized speech, comprising:
 - (a) deferring truncation of an active frame; and
 - (b) truncating a silence frame.
2. The method of claim 1, wherein:
 - (a) said packetized speech includes CELP-encoded frames; and
 - (b) said truncating a silence frame includes truncating an excitation for said silence frame.
3. The method of claim 1, further comprising:
 - (a) expanding an active frame according to a voicing classification for said active frame.
4. A method of frame playout expansion, comprising:
 - (a) classifying a frame as voiced or not; and
 - (b) expanding a voiced frame by a multiple of the pitch of said voiced frame.
5. The method of claim 4, wherein:
 - (a) said frames are CELP-encoded frames; and
 - (b) said expanding a voiced frame includes expanding an excitation for said voiced frame by a multiple of the pitch of said voiced frame..
6. The method of claim 4, wherein:
 - (a) said classifying a frame of step (a) classifies an active frame as one of (i) voiced, (ii) unvoiced, or (iii) transition; and
 - (b) expanding an unvoiced frame includes expanding an excitation for said unvoiced frame with a random fixed-codebook vector.

7. A receiver, comprising:

- (a) an input for receiving CELP-encoded frames;
- (b) a decoder coupled to said input; and
- (c) a playout scheduler coupled to said input;
- (d) said decoder operable to provide expansion of a voiced frame in response to said playout scheduler, wherein said expansion is a multiple of the pitch for said voiced frame.

8. The receiver of claim 7, wherein:

- (a) said decoder operable to provide truncation of a frame in response to said playout scheduler only when said frame is a silence frame.

Rule 41.37(c)(1)(ix) Evidence appendix

none

Rule 41.37(c)(1)(x) Related proceedings appendix

none